

Examination of the scene of suicide, roles of individual and enviromental factors

Ph.D. Thesis

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INTRODUCTION

Suicide is a serious global public health problem, and the most common type of unnatural death in Budapest. Suicide rate of Hungary was the highest in the world between 1960 and 2000 in the vast majority of years. The traditionally high suicide rate of Hungary is the second highest in the European community. The most volatile part of the system is the examination of dead at the scene. The aim of the examination to detect the time of death, the manner of death and the cause of death. Medico-legal evaluation of findings and determination of manner of death need careful investigation at the crime scene, failure can cause irreversible interruption of the process, or can cause false orientation. Medico-legal evaluation of post-mortem findings (scene, death body, anamnestic data) by medical examiner at the suicide death's scene represents an important part of forensic medicine to recognise special findings. Estimation of time of death, determination of cause and manner of death are performed at the scene. The investigation of dead body

on the scene means fundamentally differential diagnosis similarly to the patient medical examination. The investigation of suicide deaths and dead bodies at the scene is single and unrepeatable, because the differences and contexts cannot be examined subsequently.

AIMS OF THE STUDY

The aim of this study was to investigate the occurrence and characteristics of suicide events in Budapest, to show differential diagnostic analysis of suicide cases, to emphasize the importance of scene investigation based on my own investigations, and police scene investigations reports. I would like to help the prevention of suicide, based on the evaluation of data.

Hypothesises:

The methods of suicides are not independent of gender, or rather some methods are specific to gender.

The monthly and daily distribution of suicide events are not equable.

Hypotheses which emphasize the importance of scene investigation:

In cases of hanging, the occurrence of injuries which are independent of hanging are rare.

Suicide cases by sharp objects occur often in combination with other methods.

Electric marks are often missing in suicide by electrtrauma.

Frequent combinations of suicide methods make differential diagnosis more difficult at the scene.

Methods of suicide, circumstances, injuries are not typical.

MATERIALS AND METHODS

Data collection was performed from the Police (Hungarian Institute for Forensic Sciences) crime scene investigation reports made by medical examiners (n=1964) in death cases of capital Budapest between

2009-2011. In this study the occurrence and characteristics of suicide events (n=892) were evaluated. Two main subjects of the study were the examination of the scene by data collection, and the examination of corpses by physical examination. Epidemiological features (age, gender, seasonal distribution, type of scene, method of suicide), probable causes of suicide (somatic and psychiatric diseases, critical life situation, alcohol and drug problems, loneliness, family problems), psychiatric treatment, toxicological findings, previous suicidal attempts, suicidal intentions, and final notes were analysed. In this study the occurrence and characteristics of suicide events were evaluated. Position, characteristic of lividity, rigor mortis, injuries of dead body, estimated time of death, manner of death, characteristic of injuries and tools were analysed. Estimation of time of death was performed at the scene based on lividity, rigor mortis and anamnestic data.

RESULTS

All together 892 suicide cases (males 619, 69.4%; females 273, 30.6%) were investigated in this study in capital Budapest between 2009-2011. The average male:female ratio was 2.8 (/100000 male):1(100000 female). The average age was 54 years (females 58 years, males 53 years). The youngest victim was 15 years old and the oldest was 101. All together the most frequent suicide method was hanging (n=429, 48.1%). After hanging the most common methods were, overdose of prescription medications (n=168, 18.8%), jumping from a height (n=156, 17.5%), use of sharp objects (n=42 4.7%), use of firearms (n=24, 2,7%), electrotrauma (n=22 2.5%), drowning (n=21 2.4%), other suffocations (n=21 2.4%). There were gender's differences in suicide methods. The most common methods in both gender were hanging, overdose of prescription medications and jumping from a height. Hanging and use of firearms were most frequent among males, and overdose of prescription medications, jumping, drowning and electrotrauma were

more common among females ($p < 0.05$). In 626 (70.2%) cases the places of suicide were the subject's own houses. Suicide cases were the most common in inner town districts of capital Budapest (most in Budapest 8th town district). In the investigated period the seasonal distribution of suicides showed three peaks in the year, in late spring-early summer, in September and in December. Most of suicides happened at 8-12 am (180/20.2%), and less frequently at 5-8pm (9.5%). 29.1% of victims had an earlier psychiatric treatment ($n=260$, 120 females, 140 males), the most common was depression (87%). Suicide victims had somatic diseases in 14.1%, acute critical life situations in 12.9%. Crisis situations and psychiatric diseases were the most common risk factors in the age-group of 15-24. Somatic diseases (malignancies, cardiovascular diseases, disability of motility) were significant factors over 65 years. In 43.2% of females, and in 24% of males previous suicide attempts were registered. The lowest number of previous suicide attempts was in the age-group of 15-24 (13.3% males,

27.3% females), the highest number was in the age-group of 35-44 (30.7% males, 63.6% females). In 45% of females, and in 35.4% of males suicide ideations were reported. In 32% of cases suicide notes were found (37% female, 29.9% male). There were 312 (73%) typical forms of ligature furrows, and there were traumatic injuries without suspects of homicide: bruises, contusions and abrasions on the limbs (15 %) in hanging cases. Atypical resorts (e.g. fishing-line) were not found. In cases of overdose of prescription medications based on the results of scene investigations and laboratory toxicology tests the most common drug groups were benzodiazepines, antiarrhythmics, sedatives, antidepressants and antipsychotics. The average of blood alcohol concentration in these cases was 1,65 g/l. This method was most frequent in age-group of 45-54, mainly in females. In the investigated period 156 victims fell from a height, there was a peak in age-group of 15-24 and above 65. Most of them jumped from an upper floor windows of own's or acquaintance's flat. In contrast with

other methods, half of the suicide events were at night time and dawn. Using of sharp objects was not common (4,5%), gender ratio was 1:1. Usually this method occurred in combination with other methods. Sites of predilections for suicide cuts were on wrists, distal forearms. Hesitation cuts were detected in more than half of victims. Without other methods (more often in males with average 58ys) fatal suicidal stab wounds were mostly localized in the cardiac region, and fatal suicidal incised wounds localised on the neck (left and right side ratio was 1:1). The tool used is found near or lodged in the body, most individuals used knife and razorblade. Suicidal firearm injuries were not common (2,7%), occurred more common in males (average age was 56 years, usually with typical profession: policeman, soldier, huntsman). Most of cases the weapons used were pistols. Entry wounds were predominantly near contact and localized on right temple (n=10), and the mouth (intraoral shot with rifles) (n=4). Exit wounds were oppositely, the directions were variable. Multiple shots

were detected in only two cases, injuries from guns were rare. The scene usually were at that place where the weapons were stored (own house, workplace). Somatic diseases were the most common cause of suicides. Suicide by drowning were predominantly committed by womans. No victims were found in the bathtub, but all cases were in rivers or riverside. All of suicide drowning themselves were fully clothed. There were not characteristic vital injuries, in some cases blunt injuries from bump appeared, which could be enucleate at the scene. Suicide by electrotrauma was more common in females, electric mark was detected in 66% of cases. Electric marks in third part were atypical, the most frequent method was using electronic devices in the bath. It was found 64 (7.2%) complex suicides defined as the application of more than one mechanism to ensure a fatal outcome. Complex suicide were most common in males in the age-group of 20-40, who have earlier try other methods. Hanging and taking an overdose of pharmaceutical drugs were the preferred means of death

with incised wounds. Tools were at the scene. The most common causes were relationship problems, drug abuse, depression.

CONCLUSIONS

Results of this study demonstrate the importance the careful death's scene inspection to determine the manner of death's categories and to distinguish between homicide, suicide, accidental cases. Crime scene characteristics represent important factors for forensic medicine. Analysis of circumstances in suicide cases could effectively support the postmortem investigation, gives evidences and enables verification of versions. Suicide events increase with age in both gender. There is a peak in above 65, where the most common causes of suicide are somatic diseases and loneliness. Amongst young the most common causes of suicide are psychiatric disorders. In both gender the most common methods of suicide were hanging, overdose of prescription medications, and jump from height (87%). The most

common method was hanging in males (57%), and overdose of prescription medications in females (33%). Jump from height is a violent method, it was a peak in age-group of 15-24 and above 65. The less violent overdose of prescription medications were more common in age-group of 24-65 (the number of earlier suicidal attempts were the highest in this age-group). Data show that motivations of suicide have a strong part in these age-groups. Use of firearm was more common in males. Males can obtain weapons because of their jobs (policeman, soldier etc.). There is a connection between the place and the cause of suicide. Data show that most common place of suicide were subject's own house where the causes were chronic family problems and crisis situations, in public places causes were social problems, and in hospitals somatic and psychiatric diseases. The number of suicide events (in both gender and in most common methods) were higher in time of changing of seasons, origin from inadequate thermoregulation. Data show connection between daily distribution of suicide (in

both gender and in most common methods) and known changing of mood in depression. There are a lot of specific and characteristic signs at the scene, which can help to clarify the manner and the cause of death (evidences, anamnestic data, attend to relatives) and can help to prevention. Previous suicidal attempts predispose later suicide (the strongest factor according to WHO). The signs of later suicide (e.g. suicide notes, ideations) were present at the scene. Data showed differences between genders, males are more vulnerable to suicide, but in females phenomena of „cry for help” is more common. In cases of hanging the injuries without suspects of homicide (in 25%) could be explained by scene investigation. In cases of self poisoning overdose of prescription medications were the most common, scene investigation is very important because usually there are not specific signs on dead. Scene investigation is indispensable in cases of jumping and drowning to determinate the manner of death. In cases of suicide by use of sharp objects and use of firearms there are a lot of

specific signs (e.g. blood splash, tools) at the scene. Suicide by use of sharp objects is the most common method of homicide, and it combines most common with other methods, to clarify differential diagnostic problems without scene investigation is impossible. In the two third part of suicide cases by electrotrauma, electric marks were not found or were atypical (e.g. dead body was in water in bath). The manner of death cannot be detected without scene investigation. I found that the combinations of suicide methods cause differential diagnostic problems at the scene, (e.g. combination use of firearm with jumping), comprehensive scene investigation is essential. Complex analysis of scene investigation of suicide cases shows characteristic injuries of suicide methods, injuries with uncommon characteristic have to bring up the suspicion of an other person's involvement. Objective data of dead body examination at the scene made by forensic pathologist with natural scientific approach are indispensable owing to determination the time of death and the manner of

death. Objective data are very important towards to exclusion or in support of often subjective anamnestic and environmental informations. Only assesment of all information makes it possible the further correct orientation of investigation of suicide cases, helps and complements autopsy and helps documental and reassuring enuclation of suicide cases.

Publications related to the theses

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